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SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Wayne Langel Examiner #: 80603 Date: 6-16-03
Art Unit: 1754 Phone Number 308-0248 Serial Number: 09/873240
Mail Box and Bldg/Room Location: CP3-9D17 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Method for preparing manganese-based nitride having nearly zero temperature coefficient of resistivity

Inventors (please provide full names): Nam Hui Hur; ~~Eun~~ Eun OK Chi; Wan Seop Kim

Earliest Priority Filing Date: 5-16-07

**For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

Please search claims 1-5, as attached hereto.

STAFF USE ONLY	Type of Search		Vendors and cost where applicable	
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Searcher Phone #:	AA Sequence (#)		Dialog	
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Date Completed: 6/16/03	Litigation		Lexis/Nexis	
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PTO-1590 (8-01)

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L3            1 SEA FILE=REGISTRY ABB=ON  12297-75-5
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                GANESE(A)NITRIDE
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FILE COVERS APR 1973 TO FEBRUARY 28, 2003

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L14            0 SEA FILE=JAPIO ABB=ON  L7 OR L9


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FILE COVERS 1966 TO DATE.

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                 GANESE(A)NITRIDE
L8             2 SEA FILE=REGISTRY ABB=ON  (CU(L)MN(L)N)/ELS(L)3/ELC.SUB
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=> D L17 ALL HITSTR 1-4

L17  ANSWER 1 OF 4  HCAPLUS  COPYRIGHT 2003 ACS        DUPLICATE 1
AN   2002:928008  HCAPLUS
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DN 138:15925
TI Method for preparing manganese-based nitride **CuNMn3** having nearly zero temperature coefficient of resistivity
IN Hur, Nam Hwi; Chi, Eun Ok; Kim, Wan Seop
PA Korea Research Institute of Standards and Science, S. Korea
SO U.S. Pat. Appl. Publ., 5 pp.
CODEN: USXXCO
DT Patent
LA English
IC ICM C01B021-00
NCL 423351000
CC 57-2 (Ceramics)
Section cross-reference(s): 76, 77

applicants

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 2002182136	A1	20021205	US 2001-873240	20010605
PRAI KR 2001-26731	A	20010516		

AB The present invention relates to a method for prepg.a manganese-based nitride **CuNMn3** having nearly zero temp. coeff. of resistivity. The manganese-based nitride having a cubic antiperovskite structure is prepd. by heating a stoichiometric mixt. of Mn2N and Cu (molar ratio (1.45-1.55):1) in an evacuated quartz tube by sintering at 800-900.degree. for 40-60 h. The product has some advantages in that by using Mn2N as a reactant, the formation of impurities and nitrogen evapn. may be prevented, and although nitrogen is tightly bonded between metals, the manganese-based nitride has extremely low (46 ppm/K) temp. coeff. of resistivity. It is therefore useful in the field of precision measurement and in thin film resistors; it is also difficult to oxidize and can be useful in developing a wide range of hybrid materials with perovskite oxides.

ST **copper manganese nitride** manuf resistivity; manganese nitride reaction copper

IT Resistors
(method for prepg. manganese-based nitride **CuNMn3** having nearly zero temp. coeff. of resistivity)

IT 12163-53-0, Manganese nitride (Mn2N)
RL: RCT (Reactant); RACT (Reactant or reagent)
(copper reaction with; method for prepg. manganese-based nitride **CuNMn3** having nearly zero temp. coeff. of resistivity)

IT 7440-50-8, Copper, reactions
RL: RCT (Reactant); RACT (Reactant or reagent)
(manganese nitride reaction with; method for prepg. manganese-based nitride **CuNMn3** having nearly zero temp. coeff. of resistivity)

IT **12297-75-5P, Copper manganese nitride (CuMn3N)**
RL: **IMF (Industrial manufacture)**; PRP (Properties); **PREP (Preparation)**
(method for prepg. manganese-based nitride **CuNMn3** having nearly zero temp. coeff. of resistivity)

IT **12297-75-5P, Copper manganese nitride (CuMn3N)**
RL: **IMF (Industrial manufacture)**; PRP (Properties); **PREP (Preparation)**
(method for prepg. manganese-based nitride **CuNMn3** having nearly zero temp. coeff. of resistivity)

RN 12297-75-5 HCAPLUS

CN Copper manganese nitride (CuMn3N) (7CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
Cu	1	7440-50-8
Mn	3	7439-96-5

L17 ANSWER 2 OF 4 COMPENDEX COPYRIGHT 2003 EEI
AN 2001(48):4154 COMPENDEX
TI Nearly zero temperature coefficient of resistivity in antiperovskite compound **CuNMn3**.
AU Chi, E.O. (Center for CMR Materials Korea Res. Inst. of Standards/Sci., Taejon 305-600, South Korea); Kim, W.S.; Hur, N.H.
SO Solid State Communications v 120 n 7-8 Oct 16 2001 2001.p 307-310
CODEN: SSCOA4 ISSN: 0038-1098
PY 2001
DT Journal
TC Experimental
LA English
AB The temperature dependent structural, magnetic, and transport properties of a Mn-based compound **CuNMn3** with an antiperovskite structure were investigated. A ferrimagnetic transition occurs near 150 K, which coincides with the structural transition temperature from cubic to tetragonal symmetry. Below 150 K, the resistivity of this compound shows a metallic behavior. Above 150 K, however, the variation of resistivity with temperature is almost negligible, exhibiting nearly zero temperature coefficient of resistivity (TCR). Its TCR value is about 46 ppm/K near room temperature, which is about two orders of magnitude smaller than those of pure metals like Cu and Al. $CPY 2001 Published by Elsevier Science Ltd. 12 Refs.
CC 804.2 Inorganic Components; 701.1 Electricity: Basic Concepts and Phenomena; 933.1.1 Crystal Lattice; 701.2 Magnetism: Basic Concepts and Phenomena; 708.4 Magnetic Materials; 931.3 Atomic and Molecular Physics
CT *Manganese compounds; Ferrimagnetism; Electron transport properties; Crystal symmetry; Synthesis (chemical); Thermal effects; Neutron scattering; Electric conductivity of solids
ST Antiperovskite compounds; Ferrimagnetic transitions
ET Mn; Cu*Mn*N; Cu sy 3; sy 3; Mn sy 3; N sy 3; CuNMn; Cu cp; cp; N cp; Mn cp; Cu; Al

L17 ANSWER 3 OF 4 HCAPLUS COPYRIGHT 2003 ACS DUPLICATE 2
AN 1991:454691 HCAPLUS
DN 115:54691
TI Interaction of manganese-copper solid solutions with nitrogen in the range of 780-860.degree.C
AU Liu, J. W.; Ansel, D.; Debuigne, J.
CS Lab. Metall. Phys.-Chim. Mater., INSA, Rennes, F 35043, Fr.
SO Oxidation of Metals (1991), 35(5-6), 397-404
CODEN: OXMEAF; ISSN: 0030-770X
DT Journal
LA English
CC 56-7 (Nonferrous Metals and Alloys)
AB In Cu-Mn alloys nitrided by N(g) Mn forms nitrides and Cu does not. The only mixed Mn-Cu nitride is **CuMn3N**. The reaction kinetics with N are slow, and there is no internal nitriding. For alloys contg. <20

at.% Mn, N reacts very little. At higher Mn levels, the scale formed is a mixed nitride Cu1-xMn3+xN.

ST manganese copper nitriding nitride scale; nitrogen interaction copper manganese scale

IT Scale (coating)
(nitride, on copper-manganese alloys during gas nitriding)

IT Nitridation
(gas, of copper-manganese alloys, scale formation during)

IT **12297-75-5DP, Copper manganese nitride (CuMn3N), copper-deficient**
RL: FORM (Formation, nonpreparative); **PREP (Preparation)**
(formation of, on copper-manganese alloys during gas nitriding)

IT 7727-37-9
RL: USES (Uses)
(nitridation, gas, of copper-manganese alloys, scale formation during)

IT 135076-02-7, Copper 60-95, manganese 5-40 (atomic)
RL: RCT (Reactant); RACT (Reactant or reagent)
(nitriding of, scale formation during gas)

IT **12297-75-5DP, Copper manganese nitride (CuMn3N), copper-deficient**
RL: FORM (Formation, nonpreparative); **PREP (Preparation)**
(formation of, on copper-manganese alloys during gas nitriding)

RN 12297-75-5 HCAPLUS

CN Copper manganese nitride (CuMn3N) (7CI, 8CI, 9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
N	1	17778-88-0
Cu	1	7440-50-8
Mn	3	7439-96-5

L17 ANSWER 4 OF 4 HCAPLUS COPYRIGHT 2003 ACS

AN 1982:204031 HCAPLUS

DN 96:204031

TI Nitrogen alloying of copper-manganese alloys

AU Dyulgerov, K.; Danailov, D.

CS Bulg.

SO Materialoznanie i Tekhnologiya (1981), 10, 21-5
CODEN: MTEKDE; ISSN: 0204-7535

DT Journal

LA Bulgarian

CC 56-12 (Nonferrous Metals and Alloys)
Section cross-reference(s): 76

AB The prepn. of Cu alloys contg. 8-2 Mn and 0.021-0.076% N and their mech. properties were investigated. N stabilized the solid soln. At 80.degree., the elec. resistance remained const. with increasing time. The alloy is promising for the prodn. of precision elec. resistors.

ST nitrogen addn copper manganese; elec resistor copper alloy

IT Electric resistors
(precision, copper-manganese alloy for, nitrogen alloying of)

IT 7727-37-9, properties
RL: PRP (Properties)
(copper-manganese alloys contg., properties of, for precision elec. resistors)

IT **81832-58-8P**
RL: PRP (Properties); **SPN (Synthetic preparation); PREP**

(Preparation)
(prepn. and properties of, for precision elec. resistors)
IT **81832-58-8P**
RL: PRP (Properties); **SPN (Synthetic preparation); PREP**
(Preparation)
(prepn. and properties of, for precision elec. resistors)
RN 81832-58-8 HCAPLUS
CN Copper alloy, base, Cu 80-92,Mn 8-20,N 0-0.1 (9CI) (CA INDEX NAME)

Component	Component Percent	Component Registry Number
Cu	80 - 92	7440-50-8
Mn	8 - 20	7439-96-5
N	0 - 0.1	17778-88-0